Caribou Range Recovery in Alberta: 2001/02 Pilot Year

Fish & Wildlife Division

WILDLIFE CONSERVATION AND BIODIVERSITY SECTION

Alberta Species at Risk Report No. 48

Alberta
SUSTAINABLE RESOURCE DEVELOPMENT

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Caribou Range Recovery in Alberta: 2001/02 Pilot Year

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EXECUTIVE SUMMARY

The Caribou Range Recovery (CRR) project aims to speed the "recovery" of human disturbances, so that their negative effects on woodland caribou, and other sensitive wildlife species, are lessened and eventually eliminated.

Most caribou populations in Alberta are declining, and research has shown that human disturbances may be negatively affecting caribou in several ways. The negative impacts of disturbances on other wildlife species have also been widely documented. Up to 85% of some caribou ranges in Alberta are within 250 m of a linear disturbance, and natural recovery (i.e. recovery without active restoration) of these disturbances is often very slow.

The CRR project required substantial planning before restoration work could begin. Three caribou areas with significant human development were chosen: Little Smoky, Stony Mountain and Red Earth. Local planning teams were set up for each area, with representatives from Fish and Wildlife Division, Land and Forest Division, oil and gas companies, timber companies and the University of Alberta. A project manager was hired to co-ordinate the project and all three planning teams.

Local planning teams held regular meetings to choose general areas for restoration work, gather information about specific linear disturbances, choose specific developments to restore, decide on types of restoration activities, and plan for monitoring the successes of restoration work. Pre-treatment information was collected for all restored areas (including vegetation on line, slope/aspect, adjacent vegetation and human/animal/vehicle use).

About 60 km of disturbed areas were treated in 2001/02. A variety of techniques, including transplanting, seeding, tree planting and mounding were used to encourage vegetative re-growth. In addition, substantial planning was completed for the 2002/03 field seasons, project activities were communicated to a range of stakeholders, and a research and monitoring plan was initiated in collaboration with the University of Alberta.

The project will be expanded in 2002/03, to cover additional project areas in the Rocky Mountain foothills and further study the effectiveness of different restoration techniques. To ensure success in future years, greater resources should be allocated to planning, communications and the monitoring and research component of the project.

In Alberta, there are many caribou ranges with extensive linear disturbances that are recovering naturally at a slow pace. Thus, this project is expected to span several years, to ensure that substantial improvements are made to the habitat effectiveness of caribou ranges in the province.

1.0 INTRODUCTION

1.1 Goal

The goal of the Caribou Range Recovery (CRR) project is to speed the "recovery" of linear disturbances (roads, seismic lines and pipelines) and other human developments, so that their negative effects on woodland caribou and other sensitive wildlife species are lessened and eventually eliminated. An important aspect of the pilot stage of this project is to find the most effective and cost-efficient techniques to reach this goal.

1.2 Background and Rationale

Woodland caribou are a threatened species in Alberta, as designated by the Committee on Endangered Wildlife in Canada (COSEWIC 2000) and Alberta's *Wildlife Act* (Alberta Sustainable Resource Development 2001). In Alberta, recent research has shown that caribou avoid areas adjacent to seismic lines and roads (James 1999; James and Stuart-Smith 2000; Dyer *et al.* 2001; Oberg 2001), which may reduce the availability and effectiveness of habitat. Caribou were also found to cross roads less than expected, implying a barrier effect (Dyer *et al.* 2001). Research has shown that wolves, the main predator of caribou, seek out and travel faster along corridors (than in adjacent habitat), and kill caribou proximal to these lines (James 1999).

The effects of linear disturbances on other wildlife have also been widely documented (see Jalkotzy *et al.*1997 for a review). Ungulates, large and medium-sized carnivores and birds may respond negatively to linear developments at an individual and/or population level. Roads, pipelines and seismic lines enable humans to easily penetrate otherwise remote areas, which can lead to increased levels of hunting, poaching and trapping. In addition, wildlife species are affected by vehicle collisions, altered rates of predation, sensory disturbance, and metabolic stress. Linear developments can result in direct habitat loss when habitat is made unsuitable. Indirect habitat loss can occur if wildlife avoid otherwise suitable habitat that is proximal to developed areas.

Up to 85% of some caribou ranges in Alberta are within 250 m of a linear disturbance. This highlights the need to restore the existing footprint of human activity on the landscape. Since natural recovery of disturbances is slow in many areas, actions to reduce access and encourage native vegetative re-growth are needed. Habitat stewardship activities for caribou will benefit many other species, such as grizzly bear (*Ursus arctos*), wolverine (*Gulo gulo*) and bull trout (*Salvelinus confluentus*), which require large areas of relatively undisturbed habitat.

1.3 Relationship to Key Caribou Initiatives in Alberta

Alberta's provincial caribou committees – the Boreal Caribou Committee (BCC) and the West Central Alberta Caribou Standing Committee (WCACSC) – focus on planning for industrial activity on caribou ranges in Alberta. The CRR project is an important initiative for both committees, because of the demonstrated commitment to direct

management action. Caribou populations in Alberta will remain at risk so long as linear disturbances remain a significant feature on their ranges. The recently endorsed BCC Strategic Plan and Guidelines (BCC 2001) makes specific reference to the importance of recovering linear disturbances, and directs industry and government to take action to recover existing lines.

1.4 Geographic Scope

This project focused on caribou ranges with significant levels of development in northern and west central Alberta. In 2001/02, projects were initiated in the Little Smoky, Red Earth and Stony Mountain areas.

2.0 METHODS

2.1 Planning

To ensure successful implementation of the CRR project, a wide range of individuals with local knowledge came together to plan restoration activities for one specific caribou range (Little Smoky, Red Earth or Stony Mountain). These Local Planning Teams met about once per month, as required, to:

1) Pick general areas for restoration (i.e. townships);
2) Plan inventory of general areas for restoration;
3) Choose specific linear and non-linear disturbances for restoration;
4) Determine restoration treatments to apply;
5) Plan a budget and work plan for restoration activities; and
6) Discuss monitoring and research.

In addition, a fourth planning team was set up in December 2001 to expand the project into the foothills (Redrock/Prairie Creek caribou range). Since this new team was established well in advance of the field season, there has been substantial time for organisational planning, including the development of specific goals and objectives as well as roles and responsibilities of team members and stakeholders.

When choosing areas for restoration, local planning teams worked closely with key industrial players, Land and Forest Division, Fish and Wildlife Division and local trappers. These steps helped to ensure that treated areas have the maximum potential for complete restoration.

2.2 Inventory

The following inventories were conducted prior to restoration activities:

1. *Preliminary scouting* was conducted on the ground or via helicopter by planning team members or contractors, to determine access and broad suitability of sites.

2. *Detailed pre-treatment assessments* were conducted following standard procedures. Information was recorded at marked plots, with GPS (Global Positioning System) locations, and included height of vegetation, width of lines, evidence of human use and other key factors.

In addition, a third inventory was sometimes completed, when more detailed information (such as soil compaction) was required for choosing restoration techniques. This inventory was conducted after the preliminary scouting and before pre-treatment inventory. All inventory data were compiled, and will be available to the University of Alberta, caribou committees and other project partners for research and monitoring.

In the winter of 2002, substantial time was spent scouting areas for restoration work in 2002/03. In 2001/02, we quickly learned that inventories are a crucial component of this project, and may require more time and effort than the restoration activities themselves. Since many restoration activities must be carried out in the early spring, there must be extensive inventory and planning during the previous winter. For example, in the winter of 2002, detailed inventory and planning was completed in Red Earth, which will enable restoration work to go ahead as soon as conditions are favourable in the spring of 2002 (Table 1).

Table 1. Summary of inventory work in Red Earth (winter 2002).

General Location	Type of Disturbance	Estimated Distance to be Restored
Goodfish	Road	15 km
House Creek	Road Seismic line	30 km
AEC / Penny	Road Pipeline	10+ km
Tempest	Pipeline	34 km
Ogston	Road Pipeline	16 km
Conoco/Remote Penny	Road Seismic line Pipeline	30 km
Kidney	To Be Determined	Unknown
Total		**135 + km**

2.3 Restoration Techniques

A variety of techniques were used alone or in combination to restore linear and non-linear disturbances. In areas with suitable soil conditions, tree planting or seeding could occur without soil preparation. However, since slow regeneration occurred in many areas because of poor soil conditions, soil preparation was undertaken before introducing vegetation to the site. The following is a summary of the main treatments used.

2.3.1 Leave

Although not a treatment *per se*, the best option for areas with sufficient vegetative growth was simply to leave the site. In addition, sites where little could be done to introduce vegetation were also left. In these situations, suitable areas adjacent to the site were often treated.

2.3.2 Tree planting

Many of the sites with suitable soil conditions were planted with native tree seedlings. A variety of species were tested in different light and soil regimes. Planting densities were typically targeted at 2000 stems per hectare, although variable densities were tested.

2.3.3 Seeding

For sites with minimal competing vegetation, tree seed was spread in the spring. In some situations, soil conditions were improved during the previous fall and winter (e.g., through mounding or soil de-compaction – see below).

2.3.4 Transplanting

Fast growing vegetation adjacent to disturbed areas was transplanted onto the disturbed sites. Often, transplanting occurred in discrete sections (i.e. site blocks), along linear disturbances. These sight blocks were intended to discourage use by people and predators, and to promote natural re-vegetation. Frozen black spruce and tamarack were planted onto some mounds, as a test method.

2.3.5 Mounding

Hoe mounding was used to improve the soil conditions for vegetation on wet sites. In many areas, mounding was completed during the winter under frozen ground conditions, because the heavy equipment required could only be transported at this time. Vegetation introductions (through planting, transplanting or seeding) were then undertaken in the following spring.

2.3.6 Soil de-compaction

In sites with compacted soil, conditions were improved through the use of a "defrager" (type of heavy equipment), which breaks up the soil.

2.4 Research and Monitoring Plan Development

Regular updates were provided to the research subcommittees of both the BCC and the WCACSC. These updates ranged from brief overviews of work to date, to more detailed presentations and reports. Both committees have discussed, and will continue to discuss,

the monitoring and research component of the CRR project, and links with other research projects are being developed.

The WCACSC, as part of a larger research program, has put out 10 Global Positioning System (GPS) collars in the Little Smoky caribou ranges. Data collected from these collars may enable researchers to analyse the response of caribou to restored lines. Data collected during the early years of the program will largely provide pre-treatment data on caribou distribution, since substantial areas have not yet been restored.

The University of Alberta was involved in determining evaluation criteria for this project. Researchers attended planning meetings and accompanied planning team members in the field, to help design treatments that can be monitored over time. Meetings were held to define research and monitoring needs for the project (both short- and long-term), and to develop a plan to address these needs. Representatives from government, industry, caribou committees and the U of A participated. In addition to provincial-level planning, research and monitoring were discussed at the local planning team level.

3.0 RESULTS

Tables 2 and 3 provide a summary of the restoration work completed in Little Smoky and Red Earth. Activities were focused in areas regularly used by caribou. In Stony Mountain, substantial planning and inventory occurred in the 2001/02 season; however, all restoration work was postponed until 2002/03.

Table 2. Restoration work completed in the Little Smoky caribou range, 2001/02.

General Location	Legal Land	Type of Disturbance	Distance Restored	Restoration work	Planned Future Work
Reclaimed road	60-25-5 60-26-5 61-25-5 61-26-5	Road Wellsite Seismic	10 km	Tree planting (6000 trees)	None
LOC # 830192	60-26-5	Road	3 km	Tree planting (1400 pine)	None
Trans-Canada pipeline	60-26-5 61-26-5	Pipeline Road (coupled)	5 km	Tree planting (4000 pine)	Seeding
Deep Valley	61-24-5 61-25-5 61-26-5 60-24-5 60-25-5 60-26-5	Seismic	11 km	Mounding	Tree planting
Total			29 km		

Table 3. Restoration work completed in Red Earth caribou range, 2001/02.

General Location	Legal Land	Type of Disturbance	Distance Restored	Restoration work	Planned Future Work
LOC # 950618 and 973052	91-9-5	Road Seismic line	15 km	Transplanting	Tree planting Transplanting Seeding
Goodfish	91-8-5 91-9-5	Road Pipeline Seismic line	15 km	Mounding Transplanting	Tree planting Transplanting
Total			30 km		

4.0 CONCLUSIONS AND RECOMMENDATIONS

The first year of the CRR project successfully modified the characteristics of linear and non-linear disturbances, with the aim to lessen and eventually eliminate their detrimental effects on woodland caribou and other sensitive wildlife species. Although the specific benefits of the different restoration techniques will not be known until monitoring is complete, the restoration work is expected to both speed the recovery of disturbances, and reduce human and predator use.

Care was taken to apply treatments in priority areas, to achieve the greatest benefit for caribou. For example, linear disturbances leading from areas of good moose habitat (where there are likely to be high densities of wolves) to areas of good caribou habitat were targeted for much of the work. Differences in habitat requirements were considered: in the foothills of west central Alberta, upland caribou habitat was targeted to a greater extent than in the northern caribou ranges, where peatland complexes are typically used by caribou.

In addition to providing on-the-ground habitat benefits, the CRR project was successful in involving a wide range of interested stakeholders. This broad network will help to ensure that the project succeeds in future years, and can continue to expand.

There are several key recommendations for the continuation of this project:

1. *Hire managers for a full-time, full-year term.* This project requires full time management support because of the extensive planning required for restoration activities. In addition, year-round work is needed in the field (e.g. for wet areas where frozen ground conditions are required for access) and for planning (e.g. to ensure that plans are in place to initiate restoration activities in the early spring).

2. *Set aside substantial time for planning.* The time required for planning and inventory was much greater than anticipated in 2001/02, as there are many steps that must be taken before an area can be restored. First, there must be communication with government staff, trappers and other interest groups, and the various industries operating in an area. Scouting is then required to select suitable areas, and experts

must be consulted to ensure that appropriate treatments are chosen. Before restoration can take place, there are many logistical issues to deal with, such as access for heavy equipment and tree planters. In some situations, several days of work may be required simply to get heavy equipment into an area. All of these issues highlight the need to schedule substantial time for planning in the annual work plan.

3. *Direct resources to communications.* The communications aspect of this project required more time and energy than originally anticipated. Sufficient resources must be devoted to communicating with government, industry, caribou committee members and other key groups. Tools such as a web site would improve communications in future years.

4. *Direct more resources to monitoring and research.* The monitoring and research component of the project required substantial time and energy from a wide range of government, industry and university representatives. This component should be expanded in future years to ensure that treatments are applied in accordance with a well-developed study design, and that success can be monitored in the short and long term.

The recovery of existing linear development is central to mitigating the existing human-use footprint, and to recovering declining caribou populations in the province. Although steps are being taken to reduce the future human footprint on the landscape, the existing footprint is very extensive and is recovering slowly in many areas. Since there are many caribou ranges faced with this issue, and there are many linear disturbances within each range, this restoration project is expected to span many years.

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